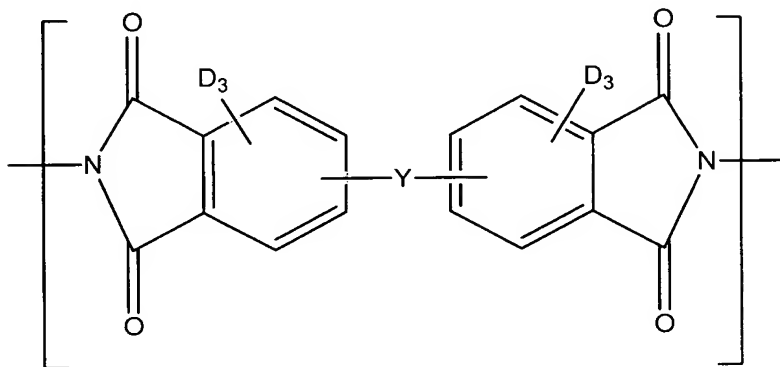


CLAIMS:

1. A deuterated polyimide, the backbone of which comprises an alternation between:

- at least one repeat unit corresponding to
5 the following formula (I):



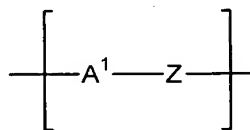
(I)

in which:

- Y represents a single bond or a spacer group; and

10

- at least one repeat unit corresponding to the following formula (II):



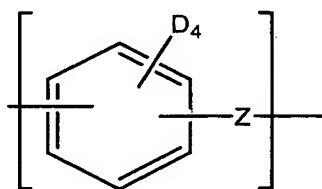
(II)

15 in which:

- A¹ represents a perdeuterated aromatic group comprising from 6 to 10 carbon atoms; and
- Z represents a single bond or a group chosen from -O-C₆D₄-, -CO-C₆D₄- and -C₆D₄-.

2. The deuterated polyimide as claimed in claim 1, in which Y, when Y is a spacer group, is a group chosen from -O-, -CD₂-, -CO-, -SO₂- or -C₆D₄-.

5 3. The deuterated polyimide as claimed in claim 1 or 2, in which the repeat unit in accordance with the formula (II) is a repeat unit of following formula (IIa):

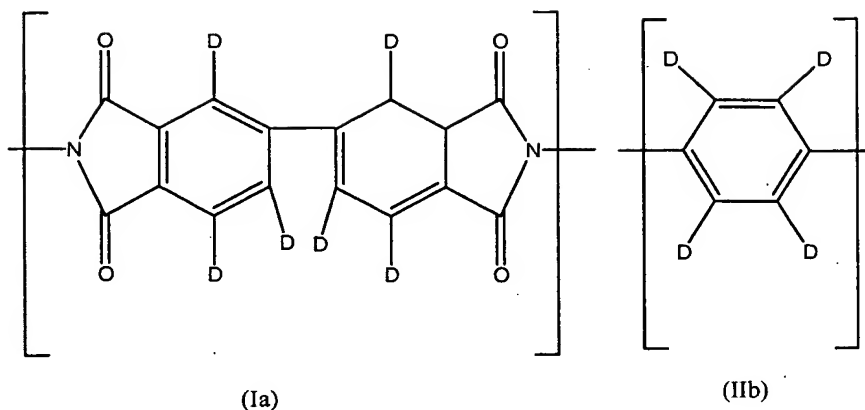


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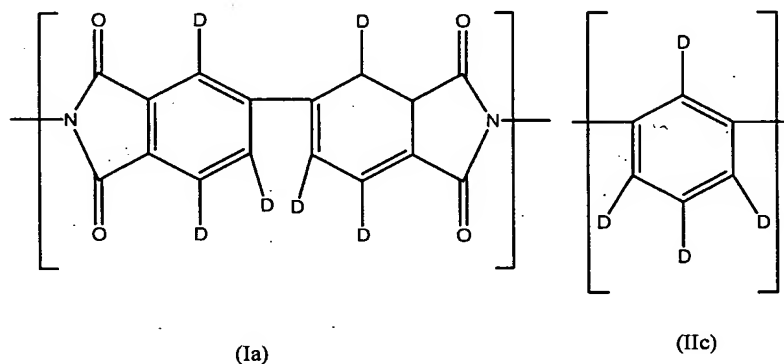
in which Z corresponds to the same definition as that given in claim 1.

15 4. The deuterated polyimide as claimed in any one of claims 1 to 3, chosen from the group consisting of the polyimides chosen from:

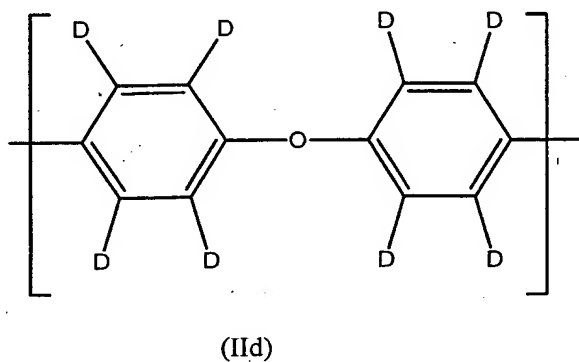
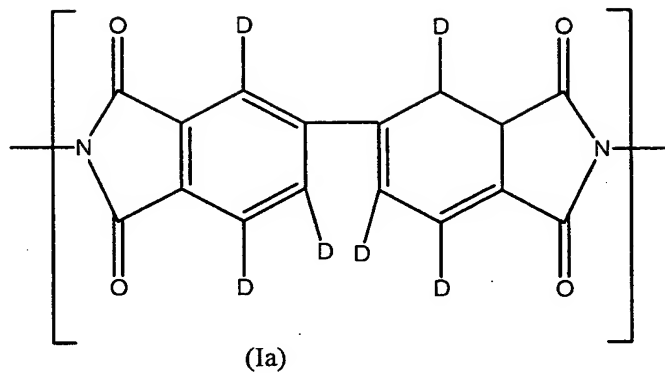
- polyimides comprising a repeat unit of following formula (Ia) and a repeat unit of following
20 formula (IIb):



- polyimides comprising a repeat unit of following formula (Ia) and a repeat unit of following
 5 formula (IIc):

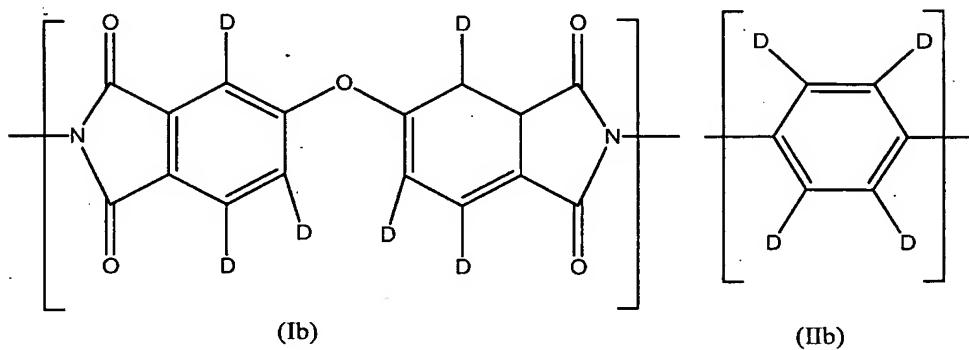


- polyimides comprising a repeat unit of following formula (Ia) and a repeat unit of following formula (IIId):

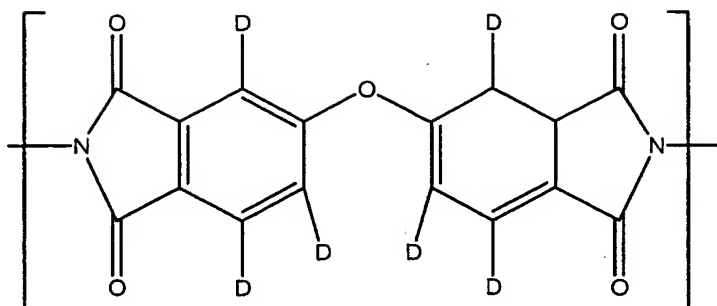


- polyimides comprising a repeat unit of following formula (Ib) and a repeat unit of following formula (IIb):

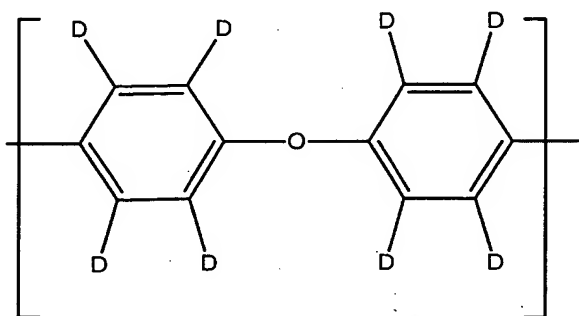
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- polyimides comprising a repeat unit of following formula (Ib) and a repeat unit of following formula (IIId):

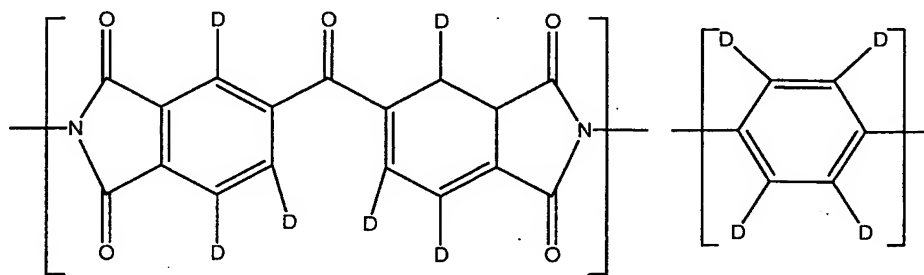


(Ib)



(IIId)

- polyimides comprising a repeat unit of following formula (Ic) and a repeat unit of following
5 formula (IIb):

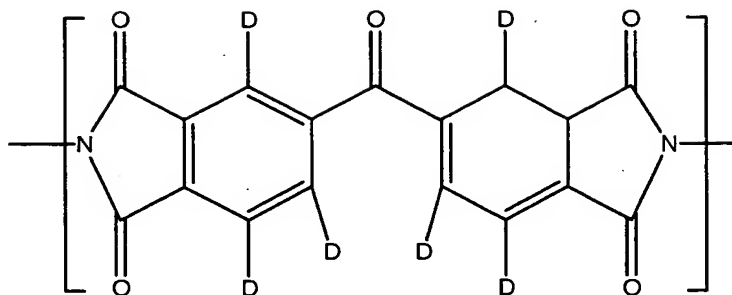


(Ic)

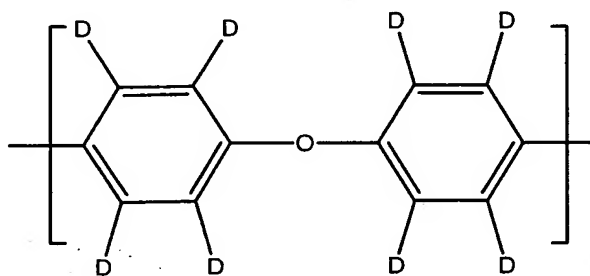
(IIb)

- polyimides comprising a repeat unit of following formula (Ic) and a repeat unit of following
10 formula (IIId):

65

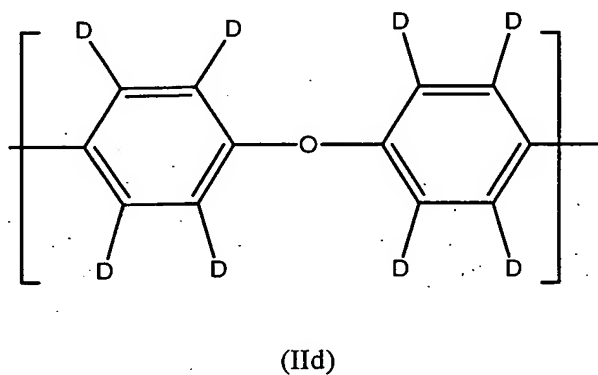
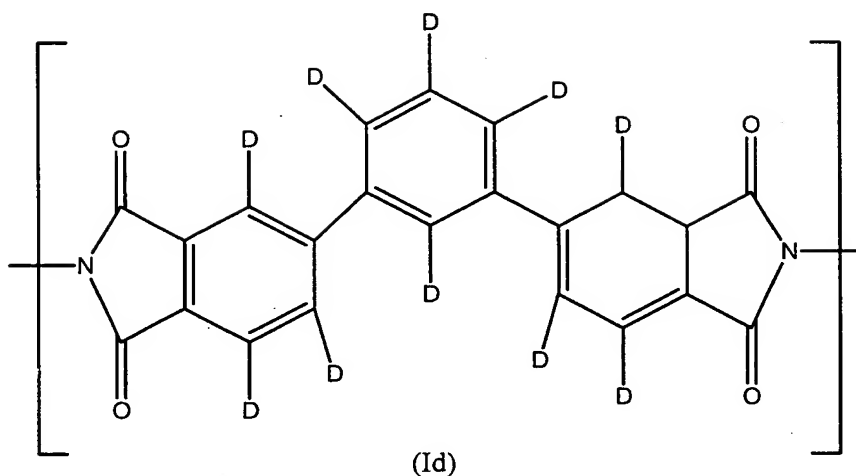


(Ic)

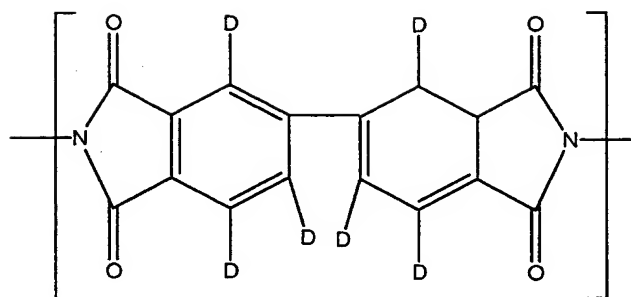


(IIId)

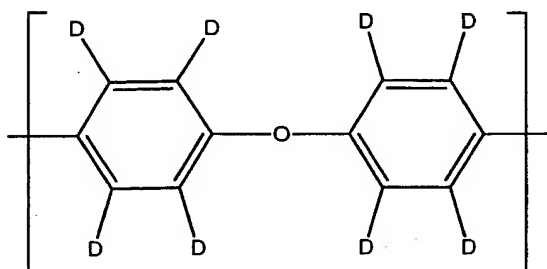
- polyimides comprising a repeat unit of
 following formula (Id) and a repeat unit of following
 5 formula (IIId):



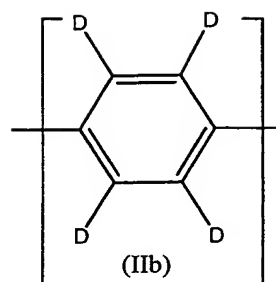
- polyimides comprising a repeat unit of following formula (Ia), a repeat unit of following
5 formula (IIb) and a repeat unit of following formula (IIId):



(Ia)



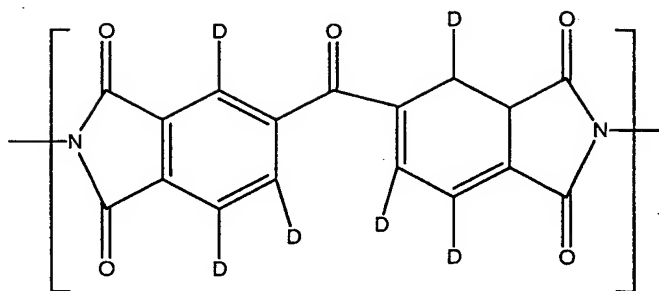
(IIId)



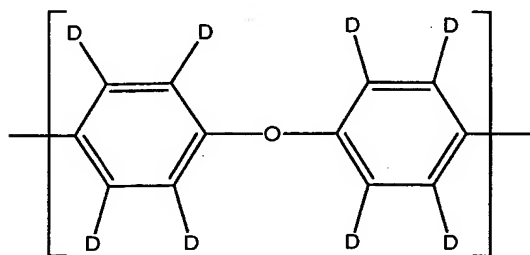
(IIb)

- polyimides comprising a repeat unit of following formula (Ic), a repeat unit of following formula (IIb) and a repeat unit of following formula (IIId):

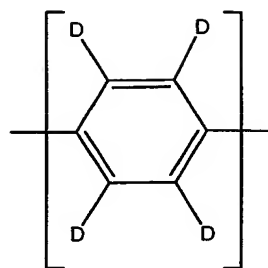
5



(Ic)

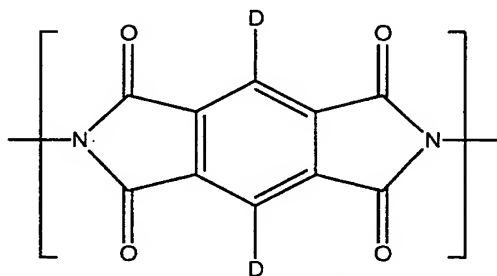


(IIId)



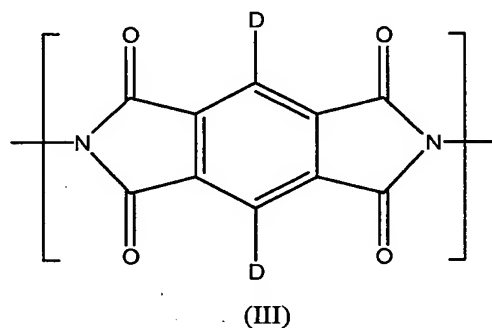
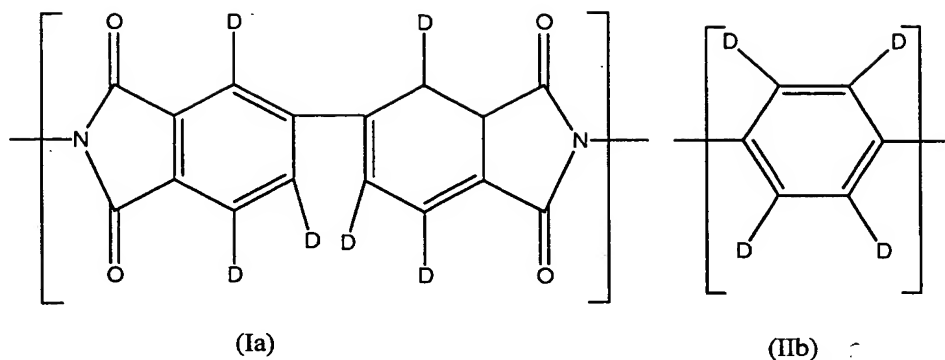
(IIb)

5. The deuterated polyimide as claimed in any one of claims 1 to 3, additionally comprising a unit corresponding to the following formula (III):

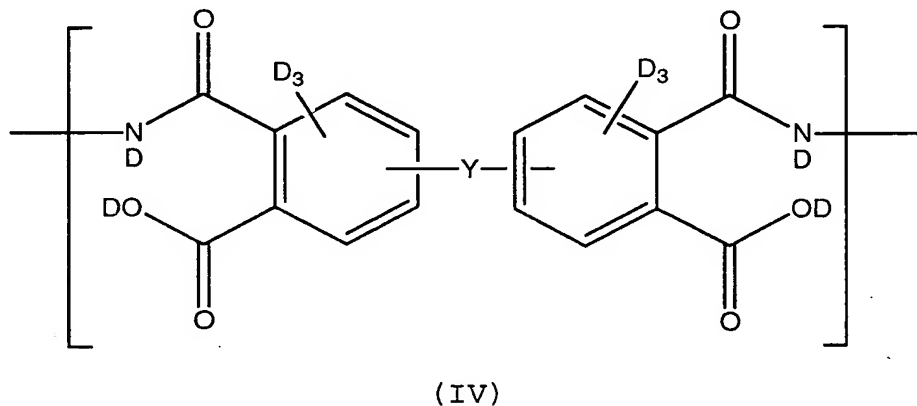


(III)

6. The deuterated polyimide as claimed in claim 5, comprising a repeat unit of following formula (Ia), a repeat unit of following formula (IIb) and a repeat unit of following formula (III):

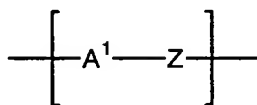


7. A process for the preparation of a deuterated polyimide as defined in any one of claims 1 to 3, said process comprising a stage consisting in treating, by heating at an appropriate temperature, a solution of a poly(amide-acid), the backbone of which comprises an alternation between at least one repeat unit of following formula (IV):



in which Y corresponds to the same definition as that given in claim 1; and

at least one repeat unit of formula (II):

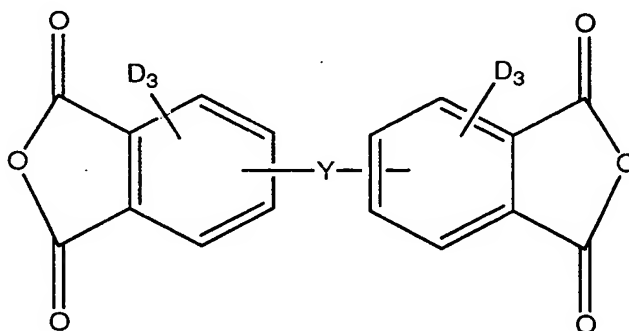


(II)

in which A¹ and Z correspond to the same definitions as those given in claim 1, the appropriate heating temperature being determined so as to obtain complete imidization of said poly(amide-acid).

8. The preparation process as claimed in claim 7, in which the appropriate heating temperature is a temperature ranging from 80 to 400°C.

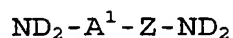
9. The preparation process as claimed in claim 7 or 8, in which the poly(amide-acid) solution is prepared by polycondensation, in a solvent, of at least one monomer of following formula (V):



(V)

in which Y corresponds to the same definition as that given in claim 1, and
of at least one monomer of following formula (VI):

5



(VI)

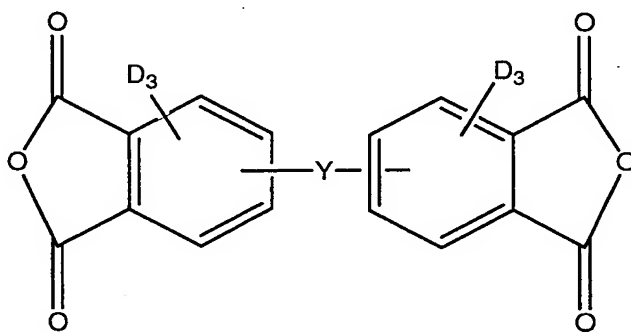
in which A¹ and Z correspond to the same definitions as those given in claim 1.

10

10. The preparation process as claimed in any one of claims 7 to 9, in which the solvent is a dipolar aprotic solvent chosen from the group consisting of N-methylpyrrolidone (NMP), dimethylformamide (DMF) and dimethylacetamide (DMAC).

15

11. A deuterated dianhydride monomer corresponding to the following formula (V):

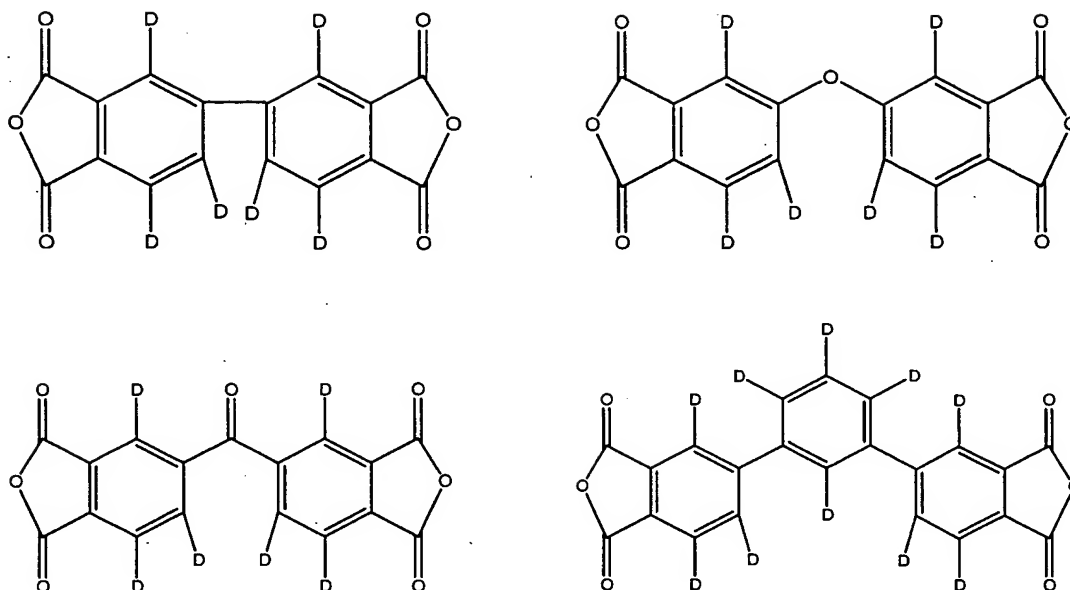


(V)

20

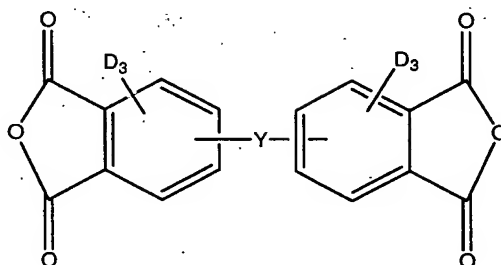
in which Y corresponds to the same definition as that given in claim 1.

12. The deuterated dianhydride monomers corresponding to one of the following formulae:



5

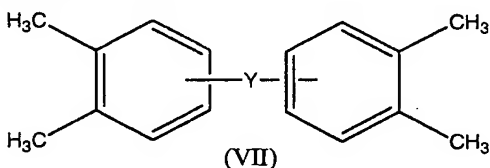
13. A process for the preparation of monomers of formula (V):



(V)

in which Y corresponds to the same definition as that given in claim 1, said process successively comprising the following stages:

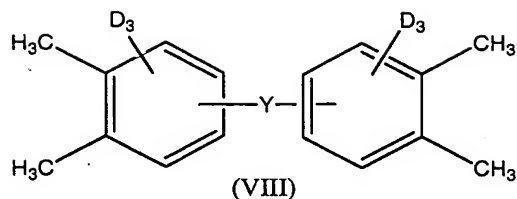
- subjecting a compound of formula (VII):



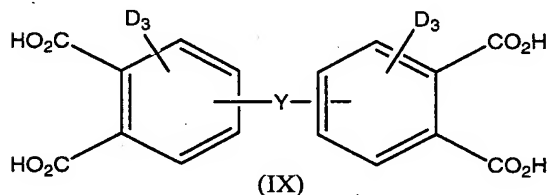
(VII)

to deuteration, so as to obtain a compound of formula (VIII):

15



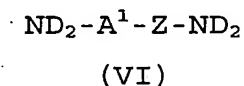
- subjecting the compound obtained above to oxidation, so as to obtain a compound of formula (IX):



5

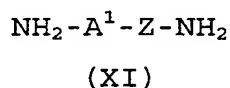
- subjecting the compound obtained above to cyclodehydration, so as to obtain the compound of formula (V).

10 14. A process for the preparation of deuterated diamine monomers of formula (VI):

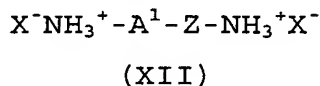


15 in which A^1 and Z correspond to the same definitions as those given in claim 1, said process successively comprising the following stages:

- reacting a compound of formula (XI):



20 with an inorganic acid of formula HX, so as to obtain an ammonium salt of formula (XII):



in which X represents a halide;

- reacting said ammonium salt with deuterated water under an appropriate pressure, followed by reacting with a base, so as to obtain the monomer of formula (VI).

5

15. A film based on a deuterated polyimide as defined in any one of claims 1 to 6.

10 16. The use of a deuterated polyimide as defined in any one of claims 1 to 6 as material which is transparent within the region from 2500 to 3500 cm^{-1} .